



E- PAYMENT INNOVATIONS AND BANK PROFITABILITY IN EMERGING ECONOMIES: EVIDENCE FROM NIGERIA

Beatrice Chinyere Eneje, Ignatius Ikechukwu Ogbu and Geoffrey Ndubuisi Udefi

Department of Accountancy, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo.

Abstract

This study examines the effect of e-payment innovations on commercial banks' profitability. To address this relationship, we use different measures of payment innovation and bank profitability. Utilizing data for the 2014 to 2023 period because of data availability, this paper considers the causal effect of all electronic transfer volume (online banking, mobile money transfer, NEFT and others), POS volume, and ATM volume on commercial banks' profitability through causality test. The 24 commercial banks in Nigeria constitute the study's population. Secondary data were sourced over the study period from NDIC annual reports, the Nigeria Inter-Bank Settlement System (NIBSS) and the Central Bank of Nigeria statistical bulletins. Based on regression analysis, ATM banking services have the largest impact on banks' profitability because of the large volume witnessed in the banking sector. Hence, more mobile, online banking and e-banking transfer services should be made available. POS transaction volumes did not demonstrate a significant relationship with Return on Assets according to empirical results. The study recommends that banks should invest in improving their electronic funds transfer systems and POS networks to facilitate greater transaction volumes. This may involve upgrading technology, expanding coverage, and improving accessibility to promote higher usage among customers.

Keywords: Payment System Innovations, Bank Profitability, Return on assets, financial inclusion, Nigeria

Introduction

Payment innovations can be explained as any fintech solution that offers a new or unique way to pay for a product or service generally to make the experience more convenient and faster for the user. Payment innovation is accomplished through the deployment of a branchless banking system and technological adoption (Ashiru, Balogun and Paseda, 2023). In recent years, the Nigerian banking sector has witnessed significant transformations driven by digitalization. Globalization via technological advancements and the proliferation of digital payment platforms have revolutionized the way

financial transactions are conducted, presenting both opportunities and challenges for banks operating in the country. Against this backdrop, understanding the relationship between payment system innovations and bank profitability has become a subject of increasing interest among researchers and policymakers. The Nigerian banking sector plays a crucial role in the country's economy, serving as a key intermediary between savers and borrowers while facilitating economic growth and development. With the introduction of various payment system innovations such as Internet

banking, Automated teller Machine (ATM), banking correspondents, Point of Sale (POS), Mobile Money Transfer (MMT), online money payment (WEB), and others in addition to the fact that more and more business accept non-cash payments, such as payments with bank cards, electronic transfers, digital code payments, and even cryptocurrencies like Bitcoin. As fragile as the banking sector is, it has to accelerate its investments in innovation and digital enhancement because technologies continuously evolve, banks have been able to expand their service offerings, reach a wider customer base, and enhance operational efficiency. These innovations have not only improved customer experience but have also contributed to the overall efficiency and stability of the financial system (Norden et al., 2014)

However, the adoption and implementation of payment system innovations are influenced by the prevailing institutional environment, characterized by regulatory frameworks, government policies, legal frameworks, technological infrastructure, and market competition (Mugane, 2015; Chong-chuo chang, 2023). The effectiveness of payment system innovations in driving bank profitability is contingent upon the supportive institutional environment that fosters innovation, promotes financial inclusion, and ensures the security and integrity of financial transactions (Korir et al., 2015; Lee et al., 2020). Payment system innovations products provide an opportunity for banks to have a momentous cost advantage, boosting profitability, ease of processing and minimising risk than traditional banking system (Muhamad, Ibrahim, and Muritala, 2022).

However, regarding the effect of payments system innovation on bank profitability, several authors posit that there are conflicting results and that no consistent results have been reached (Ugbede, Yahaya and Edicha, 2019; Ashiru, et al., 2023; Mohammed, Ibrahim and Muritala 2022; Mustapha 2018; Heber Bernardo, Evaristo and Camillo, 2022). But some studies indicate that there is a positive impact of payment system innovation on the profitability of banks for example, (Dong et al., 2020; Okafor 2020; Shahabi and Razi, 2019; Medyawati et al., 2021). On the contrary, the studies of Nwankwo and

Eze (2013); Onay and Ozsor, (2013); Dede Sri Sudaryanti and Nana Sahronic (2018) revealed a negative effect on the financial performance of the commercial banks.

Despite the potential benefits of payment system innovations, there are also challenges and risks associated with their adoption. These include cybersecurity threats, operational risks, regulatory compliance requirements, and the need for substantial investments in technology and infrastructure. Moreover, the effectiveness of payment system innovations in enhancing bank profitability may vary depending on the specific environment within which the banks operate. More studies are needed to ascertain the combination of the payments innovation effect on profitability. This is because the benefits of using multiple payment platforms outweigh those of a single payment system and is necessary to make an overall examination of the effects of payment platforms on profitability starting from the period that many of them were adopted. This study will focus on assessing the impact of all electronic fund transfers (mobile banking, online/internet banking, NEFT and others), ATM transactions, and point-of-sale (POS) transactions on the return on assets (ROA) of commercial banks in Nigeria over ten years, from 2014 to 2023. Therefore, this study seeks to investigate the relationship between payment system innovations and bank profitability in Nigeria. By examining the factors that influence the adoption and impact of payment system innovations on bank profitability, the study aims to provide valuable insights for policymakers, regulators, and banking industry stakeholders. Additionally, the findings of the study are expected to inform strategies for enhancing the efficiency, resilience, and increase in several participants that translate to profitability of the Nigerian banking sector in the digital age.

The digitalization taking place across the African continent, (as in Nigeria, where digital hybridization is creeping into every sector and population, creates an immediate need for examination (Ochinanwata and Agu, 2023). Nigeria is an emerging economy and an important player in the African continent. The population of Nigeria is more than 200 million and a good economy to examine. With the

changing developments and improvements to technology-enabled banks and digital connectivity, Nigeria can perfectly fit in, in the new economic opportunities and change lives (World Bank, (2019).

Profitability is an important element in any organization because it measures efficiency in the management of financial and economic resources. It is based on the conflicting results of the previous studies on this area that a study from a Nigerian perspective is needed to ascertain the multi-technology payment system innovations and bank profitability in the country from the policy's inception in 2014 – 2023. More studies are needed to ascertain the combination of the financial payments structure innovations effect on profitability. The benefits and costs far outweigh those of a single payment system and is necessary to make an overall examination of the impact of e-payment platforms on profitability starting from the commencement of the policy to date. In an ideal scenario, payment innovations should serve as catalysts for enhancing bank profitability in Nigeria. These innovations are expected to improve operational efficiency, expand customer reach, and drive revenue growth for banks. Moreover, in an ideal environment characterized by supportive regulatory frameworks and technological infrastructure, payment system innovations should facilitate seamless, secure, and cost-effective financial transactions, contributing to overall economic development and financial inclusion (Ochinanwata et al., 2023)

However, the reality in Nigeria's banking sector presents several challenges that hinder the realization of these ideas. According to Ashiru et al., (2023), Nigerian banks are highly supervised by the country's central bank, and they may not be free to embrace all financial innovations without the regulators' express approval but financial innovations are a way for financial firms to improve their revenues. Despite the proliferation of payment system innovations, banks face obstacles such as inadequate technological infrastructure, regulatory constraints, cybersecurity threats, operational risks, and limited financial literacy among the populace (Lee et al.,2020). These challenges impede the effective adoption and

implementation of payment system innovations, limiting their potential to enhance bank profitability. Moreover, the lack of interoperability and standardization among different payment platforms further complicates the landscape, leading to fragmentation and inefficiencies in the payment ecosystem.

If these challenges are not adequately addressed, they can have significant implications for Nigeria's banking sector and the broader economy. Banks may struggle to leverage payment system innovations to their fullest potential, leading to suboptimal profitability, loss of market share, and diminished competitiveness (Lee et al., 2020). Moreover, without robust cybersecurity measures and regulatory oversight, the financial system may become vulnerable to fraud, cyber-attacks, and systemic risks. This could erode trust and confidence in the banking sector and deter investment. Additionally, the lack of financial inclusion and access to formal banking services could perpetuate socio-economic inequalities and impede poverty alleviation efforts.

By examining data from 2014 to 2023, the study aims to capture a broader range of economic cycles, regulatory changes, technological advancements, and consumer preferences that may have influenced the adoption and usage of electronic payment services by banks and their customers over the past decade. This extended timeframe allows for a more robust analysis of the relationship between electronic payments and bank profitability, considering both short-term fluctuations and long-term trends.

Conceptual Review

Concept of Payment System Innovations

Payment system innovations refer to the introduction of new technologies, processes, or methods that revolutionize the way transactions are conducted, processed, and settled. It is a process carried out by banks to create, promote and adopt a new incremental and radical products, platforms and processes with the tendency to invest more in alternative channels to physical branches as digital users demand. These innovations aim to enhance the efficiency, security, accessibility, and convenience of payment systems for consumers, businesses, and

financial institutions (Abir & Chokri, 2010; Mohammed, 2022).

E- Payment innovations often leverage advancements in technology, such as mobile devices, biometrics, blockchain, and artificial intelligence. These technologies enable new payment methods, such as mobile payments, contactless transactions, and peer-to-peer transfers, that offer greater speed, has helped to make operations easy, secured, competitive and boost the variety and service quality delivery and convenience compared to traditional payment channels (Al-Jabir, 2012; Mahammed et al., 2019; Arisa & Nyangena, 2015; Kero, 2013).

Again, innovations in payment systems aim to increase financial inclusion by providing access to banking and payment services for underserved populations, including the unbanked and underbanked. Mobile money platforms, digital wallets, and prepaid cards offer low-cost alternatives to traditional banking services, empowering individuals to participate in the formal financial ecosystem (Beck et al., 2012).

Modern payment systems emphasize interoperability and integration across different payment networks, platforms, and devices (Korir, 2014). Open banking initiatives and application programming interfaces (APIs) enable seamless data sharing and connectivity between financial institutions, FINTECH companies, and third-party service providers, facilitating innovation and collaboration within the ecosystem (Boot & Marinč, 2010).

Payment system innovations operate within regulatory frameworks established by government authorities and regulatory bodies to ensure consumer protection, financial stability, and compliance with anti-money laundering (AML) and know-your-customer (KYC) requirements. Regulatory sandboxes and innovation hubs provide a conducive environment for testing and scaling new payment solutions while mitigating risks and promoting responsible innovation (Gianiodis et al., 2014; Mohammed et al., 2022).

Volume of Electronic Fund Transfers

The concept of Volume of Electronic Fund Transfers encompasses the total number of electronic fund transfers processed within a

payment system (Norden et al., 2014). It serves as a crucial indicator of the adoption and utilization of digital payment methods, such as online banking, mobile payments, and wire transfers. Increasing the volume of electronic fund transfers signifies the ongoing transition towards cashless transactions and the modernization of payment infrastructure (Adith & Ngari, 2014; Ugbede, Yahaya, and Edicha, 2019).

Volume of ATM Transactions

Volume of ATM Transactions reflects the total number of transactions conducted through automated teller machines (ATMs). It represents the usage of ATMs for various banking services, including cash withdrawals, deposits, balance inquiries, and transfers. Optimizing ATM networks, enhancing functionality, and promoting convenience are key objectives of payment system innovations aimed at increasing the volume of ATM transactions (Alexandru et al., 2008). The use of ATMs increases the chances of customers withdrawing as many times as possible, thereby removing the liability of paying interest on most savings accounts as well as reducing the cost of servicing customers.

Volume of Point-of-Sale (POS) Transactions

Volume of Point-of-Sale (POS) Transactions measures the total number of transactions completed at point-of-sale terminals, where customers make purchases using debit or credit cards. These variables indicate the growing adoption of electronic payment methods and the shift towards cashless transactions in retail environments. Payment system innovations focus on expanding acceptance networks, improving transaction speed and security, and promoting contactless payment methods to boost the volume of POS transactions (Johnson & Kwak, 2012). POS system is a significant contributor to the overall revenue in volume being generated by banks

Return on Assets (ROA)

Return on Assets (ROA) is a financial metric that evaluates the profitability of a financial institution relative to its total assets. It reflects the efficiency and effectiveness of asset utilization in generating profits. Payment system

innovations aim to improve ROA by increasing transaction volumes, reducing transaction costs, enhancing operational efficiency, and diversifying revenue streams through value-added services and products (Cherotich, 2015).

Theoretical Framework

This study on payment system innovations and bank profitability in Nigeria is theoretically underpinned by the social learning theory.

The Social Learning Theory, proposed by Albert Bandura, can serve as a theoretical framework to underpin the study of payment system innovations. This theory suggests that individuals learn by observing the behaviors, attitudes, and outcomes of others, and they subsequently imitate or model those behaviors. Here's how the Social Learning Theory is relevant to the study:

Observational Learning: According to the Social Learning Theory, individuals observe the behaviors and experiences of others to learn new skills and behaviors. In the context of payment system innovations, individuals may observe their peers, family members, or colleagues using digital payment methods such as mobile banking or POS payments. By witnessing the convenience, security, and efficiency of these payment methods, individuals are more likely to adopt similar behaviors and embrace digital payments themselves.

Modeling and Imitation: Social Learning Theory emphasizes the role of modeling and imitation in the learning process. Individuals are more likely to adopt behaviors that they perceive as successful or beneficial. In the context of the study, if individuals observe their peers or role models successfully using electronic fund transfers, ATMs, or point-of-sale (POS) terminals for transactions, they are more inclined to emulate those behaviors and engage in similar payment activities. Positive experiences and outcomes associated with payment system innovations serve as models for adoption and behavior change.

Reinforcement and Vicarious Learning: Social Learning Theory also highlights the importance of reinforcement and vicarious learning in shaping behavior. Individuals are more likely to adopt behaviors that are reinforced with positive outcomes or rewards. In the context of payment system

innovations, positive experiences such as quick and seamless transactions, enhanced security features, and rewards or incentives for digital payments serve as reinforcements that encourage further adoption and usage of digital payment methods.

Social Context and Norms: Social Learning Theory emphasizes the influence of social context and norms on behavior. Individuals are more likely to adopt behaviors that are socially accepted and prevalent within their social networks. In the context of the study, social norms and peer influences play a significant role in shaping attitudes and behaviors towards payment system innovations. Positive experiences and endorsements from peers or influential figures contribute to the normalization and acceptance of digital payment methods within communities.

Hence, the Social Learning Theory provides a comprehensive framework for understanding the adoption and diffusion of payment system innovations. By examining how individuals learn from their social environment, observe and model the behaviors of others, and are influenced by social norms and reinforcement mechanisms, the theory helps elucidate the factors that drive the adoption and usage of digital payment methods. Integrating the Social Learning Theory into the study can provide valuable insights into the mechanisms underlying behavior change and inform strategies to promote the adoption of payment system innovations.

Empirical Review

Beck et al., 2016; Chortareas, Girardone and Ventouri, 2009, Lee, Wang and Ho 2020 in their studies find that financial innovation positively affects the banking industry general growth, efficiency, productivity, and profitability. Zu, Gu, Li and Bonsu (2019) study of the impacts of financial innovations on bank profitability in Africa between 2015 – 2018 revealed that bank card and ATMs contributed to a bank's financial success. Berk (2002) researched the link between financial innovation and central banking and concluded that in a world characterized by ongoing financial innovation, reserve requirements will allow the central bank to control overnight rates, provided they are implemented in a market-oriented fashion.

Roberts and Amit (2003) researched the relationship between innovation and the emergence of differentiated competitive positions in Australian Retail Banking. They found that innovative activity significantly affects current financial performance. Abir and Chokri (2005) examined the adoption of financial innovations in products and processes within the Tunisian banking industry during the period from 1987 to 2008. They concluded that the legal framework influences the innovative behavior of the Tunisian banking system to a large extent.

Francesca and Claeys (2010) carried out a study with the aim of examining the role of online banking services in contributing to strategic goals. The study was conducted among 60 large banks operating in the European Union. The study revealed that banks with a goal of increasing their market share were likely to adopt financial innovations such as internet banking because they could reach more customers. However, banks solely dependent on the internet were noted to have low performance because they had spent a lot of money venturing into internet banking, and subsequent labor cost savings could not be sufficient to recoup the initial capital outlay. Therefore, it is important for banks to prudently decide which financial innovations to adopt.

. Studies by Itay and Emmanuel, 2014; Ashiru et al., 2023; Frank and Binaebi, 2019; Akwam & Yua, 2021 indicate that ATM as well as other payments innovation has positive impact on bank performance. But study by Anselm Ngwa (2020) indicates that ATM cards have negative impacts on the return in assets of the banks in Cameroun.

Irura and Munjiru, 2013; Ashiru et al., 2023; studies conclude that the relationship between POS and payment innovations positively affects financial performance and is expressed in the increase in profitability; with a more significant number of correspondents and a greater volume of transactions the performance increases.

Malhotra and Singh (2010) carried out a study to establish the impact of Internet banking on the financial performance of commercial banks in India. The study had a keen interest in establishing whether the period of adoption of

internet banking had an impact on performance. Specifically, the study sought to establish whether banks that had adopted internet banking for longer periods had superior performance over those that had adopted banking for a shorter time period. A multiple regression model was used, and 82 banks were selected. The study found that there was no statistically significant difference among banks that had adopted internet banking for longer periods compared to those which had recently adopted internet banking. Furthermore, the regression model established that internet banking had no effect on the financial performance of commercial banks in India.

Mabrouk and Mamoghli (2010) carried out a study aiming at establishing the impact of emerging trends on the performance of banks. The study considered the use of ATMs, Mobile banking, and other technological mechanisms that facilitate the banking process. The study established that banks that adopted innovations earlier had superior performance compared to those that adopted much later, perhaps due to the first-mover advantage. It is important to note that technology changes quickly, and if firms take long to adopt, it may be of value because other better forms of technology will have emerged. Mohammed et al., 2023; Ashiru et al., 2023; Medyawatic et al 2021) conclude that mobile banking and internet banking transactions positively affect profitability.

(2014) used a descriptive research design and sought to establish if the value of Electronic Funds Transfers and RTGS transactions had an effect on the financial performance of banks. The study revealed that these financial innovations explained a large extent of changes in the financial performance of commercial banks in Kenya.

Yin and Zhengzheng (2010) carried out research in China to analyze the operational changes due to technological innovations. Their study indicated that banks that adopted innovations in processes were more profitable. When a bank adopts streamlined operations, such as using internet banking, it may result in low operational costs. Thus, the commercial bank may save on costs, thereby improving its performance. It is a process whose effect on the performance of commercial banks needs to be studied further.

Nader (2011) established that the fact that commercial banks adopted mobile and internet banking, was not a reason enough to expect more profits. This study sought to establish the profitability of banks in Saudi for a period of 10 years. The study tested contradicting results for the various aspects of financial innovations. On one hand, the use of mobile banking and Automated teller Machines (ATM) had a positive effect on the profitability of commercial banks in Saudi Arabia. On the contrary, availability of these services did not necessarily indicate a chance of more profits. Thus, the study implies that financial innovations may or may not lead to improved financial standings. This instant study seeks to establish the effects of financial innovations on total income and return on assets of commercial banks in Kenya.

Nyangosi and Aora (2011) conducted a study to examine the impact of information technology and banking performance in Kenya. The study adopted a descriptive research design and had a population of all commercial banks in Kenya. The study established that the use of internet banking and mobile banking had been adopted by most banks. The study found that the use of ATM and mobile banking led to service excellence and thus improved the performance of financial institutions. Further, the study revealed that information technology is an important development in the banking sector. In as much as this study reveals that the use of financial innovations increases the rate of customer satisfaction, it does not indicate whether they lead to better performance.

Nodern, et al. (2012) argued that this is consistent with banks passing on risk management benefits to corporate borrowers but not with alternative channels through which credit derivative use may affect loan pricing. They found that the magnitude of the risk management effect remained 11.

Beck, Chen, Lin and Song (2012) searched the relationship between financial innovation in the banking sector and (i) real sector growth, (ii) real sector volatility, and (iii) bank fragility. They found that a higher level of financial innovation is associated with a stronger relationship between a country's growth opportunities and capital and GDP per capita growth and with

higher growth rates in industries that rely more on external financing and depend more on innovation. On the other hand, they found that financial innovation is associated with higher growth volatility among industries more dependent on external financing and on innovation and with higher idiosyncratic bank fragility, higher bank profit volatility and higher bank losses during the recent crisis period of 2007-2009.

Şimşek (2013) analyzed the channels by which financial innovation affects portfolio risks in an environment with both risk-sharing needs and belief disagreements. He found that financial innovation that increases portfolio risks also exacerbates the negative externalities, and might lead to inefficiency. Mugane (2015) investigated the effect of financial innovations on the financial performance of commercial banks in Kenya. The study concluded that the relationship between product innovation and the financial performance of commercial banks is negative and significant.

Nader (2011) established that the fact that commercial banks adopted mobile and internet banking was not reason enough to expect more profits. This study sought to establish the profitability of banks in Saudi Arabia over 10 years. The study tested contradicting results for various aspects of financial innovations. On one hand, the use of mobile banking and Automated Teller Machines (ATMs) had a positive effect on the profitability of commercial banks in Saudi Arabia. On the contrary, the availability of these services did not necessarily indicate a chance of more profits. Thus, the study implies that financial innovations may or may not lead to improved financial standings. This instant study seeks to establish the effects of financial innovations on total income and return on assets of commercial banks in Kenya.

Methodology and scope

This study is aimed at establishing the relationship that exists between payment system innovations on the profitability of banks in Nigeria. The study is focused on commercial banks registered by the Nigeria Deposit Insurance Commission (NDIC) and covers a period of ten years (2014- -2023). The reason for

using the current year's period is to capture trends in payment innovation that are relatively new to the Nigerian context and contain data for the period. The transaction volume of ATM, POS and web/online transactions were obtained from the CBN statistical bulletin under payments systems statistics and NIBSS -Nigeria Inter-bank Settlement System statistics for financial innovation. Return on Assets (ROA) was obtained from the NDIC's report on the financial condition and performance of commercial banks for financial performance. The relationship between the generated independent variable and the dependent variable was studied using a regression model.

Model Specification

The following model was developed in line with the variables of the study:

Table 1: Summary of Panel Least Squares Regression Analysis

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 03/16/24 Time: 04:10
 Sample: 2014 2023
 Periods Included:
 10
 Cross-sections included: 12
 Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EFTV	0.833333	1.075408	78021771	0.0000
ATM_TV	3.191208	1.205408	2.650479	0.0380
POS_TV	-4.114509	6.814309	-0.603983	0.5680
C	-2.647786	1.341402	-1.973895	0.0958
R-squared	1.000000	Mean dependent var		54870947
Adjusted R-squared	1.000000	S.D. dependent var		11055680
S.E. of regression	0.359189	Akaike info criterion		1.079238
Sum squared resid	0.774100	Schwarz criterion		1.200272
Log likelihood	-1.396190	Hannan-Quinn criter.		0.946464
F-statistic	2.841115	Durbin-Watson stat		2.575353
Prob(F-statistic)	0.000000			

Source: E-view 11 Statistical output, 2024

$$ROA = \beta_0 + \beta_1 EFTV_{it} + \beta_2 ATM_TV_{it} + \beta_3 POS_TV_{it} + \epsilon_{it}$$

Where:

ROA = Return on Assets

EFTV = Electronic Fund Transfer volume

ATM_TV = ATM Transactions Volume

POS_TV = Point-of-sale (POS) Transactions Volume

ϵ_{it} = error terms

t = time

Method of Data Analysis

The study used regression analysis to analyze the data collected from CBN and NDIC the commercial banks in Nigeria during the period 2014 to 2023.

Results

Table 1 revealed that electronic fund transfer volume exerts a positive and significant effect on return on assets. The coefficient estimate for electronic fund transfer volume is 0.833333 where ($p < 0.05$), indicating that a one-unit increase in electronic fund transfer volume is associated with an increase in return on assets by approximately 0.833333 units. This suggests that higher levels of electronic fund transfer volume are likely to contribute positively to return on assets. ATM transactions volume also has a positive and significant effect on return on assets. The coefficient estimate for ATM transactions volume is 3.191208 ($p < 0.05$), implying that a one-unit increase in ATM transactions volume leads to an increase in return on assets by approximately 3.191208 units. This indicates that higher levels of ATM transactions volume are likely to have a positive impact on return on assets. Point-of-sale (POS) Transactions Volume exerts effect on returns on assets. The coefficient estimate for Point-of-sale Transactions Volume is -4.114509, but it is not statistically significant ($p > 0.05$). This suggests that the relationship between Point-of-sale Transactions Volume and return on assets is not reliable or significant in this study. Therefore, the study cannot conclude that Point-of-sale Transactions Volume has a significant effect on ROA based on the available evidence. This may be due to high bank charges and low volume of transactions in the banking sector. These results were consistent with other studies (Ashiru et al., 2023; Mohammed et al., 2022). This finding suggests that Nigerians preferred electronic-based applications platforms of commercial banks to traditional application due to ease, convenience and accessibility provided via payment innovations which in turn increase volume of electronic-based applications channel and increase efficiency as well as effectiveness in the profitability of banks. POS adversely affects bank profitability and this finding conformed with Mohammed et al., 2022. NEFT-National Electronic Fund Transfer and NIBSS-Instant Payments (NIP) adversely affects bank profitability and this finding conformed with (Ashiru et al., 2023; Akhisar, Tunay, and Tunay 2015). This reason is that banking community and customers prefer traditional based banking to

electronic-based banking due to high level of financial illiteracy, poor and epileptic power supply and poor internet access.

Conclusion and recommendation

The study concludes that, in general, payment innovations have a favorable impact on the profitability of banks in Nigeria measured by ROA which is similar with the findings of Dong et al., (2020); Okafor (2020); Shahabi and Razi, (2019); Medyawati et al., (2021) but opposed Nwankwo and Eze, (2013); Onay and Ozsor, (2013) that payment innovation particularly internet banking had no significant impact on bank profitability. These results underscore the importance of electronic transaction strategies, particularly EFTV and ATM_TV, in enhancing bank financial performance. By leveraging these channels effectively, banks can optimize their operations and drive profitability. However, the non- significant relationship between POS_TV and ROA suggests that further exploration may be needed to understand its potential impact or identify other factors influencing financial performance. Overall, the findings provide valuable insights for bank decision-makers in formulating strategies to maximize electronic transaction volumes and ultimately improve financial outcomes. Banks should modernize their financial services by fully adapting to mobile banking/electronic funds transfer systems, according to the report, to boost market share. invest in improving their electronic funds transfer systems and ATM networks to facilitate greater transaction volumes. This may involve upgrading technology, expanding coverage, and improving accessibility to promote higher usage among customers.

Deposit money banks should develop targeted marketing campaigns and promotional strategies to encourage greater adoption and usage of electronic payment channels, such as EFT and ATM transactions. This may involve offering incentives, discounts, or rewards to incentivize customers to utilize these channels. While the study did not find a significant relationship between POS transaction volume and financial performance, further research may be warranted to explore the underlying factors influencing this relationship. Organizations could conduct

qualitative studies or market analyses to better understand customer preferences, barriers to adoption, and opportunities for improving POS transaction volumes.

References

- Abir, M., & Chokri, M. (2010). Is financial innovation influenced by financial liberalization? Evidence from the Tunisian banking industry. *Banks and Bank Systems*, 5(3), 97-111.
- Adith, J.K., Ngari, J.M. (2014). Effects of financial innovations on the financial performance of commercial banks in Kenya. *International Journal of Humanities and Social Science*, 4(7), 23-56.
- Alexandru, C., Genu, G., & Romanescu, M.L. (2008). The assessment of banking performances- indicators of performance in bank area. MPRA Paper No. 11600.
- Al-Jabir, I.M. (2012). Mobile banking adoption: Application of diffusion of innovation theory. *Journal of Electronic Commerce Research*, 1(1), 276-289.
- Akwam, P.O. and Yua, H. (2021). Effect of financial products on the financial performance of Selected Deposit money banks in Nigeria: 2005 – 2019. *European journal of Accounting, Auditing and Finance Research*, 9, 124 – 143.
- Ansalem, N. N. (2020). Electronic Banking transactions and their effects on the performance of selected commercial banks in Cameroun. *Research journal of Finance and Accounting*, 11, 107 – 115.
- Ashiru, A., Balogun, G., and Paseda, O. (2023). Financial innovation and bank performance: evidence from Nigeria Deposit Money Banks. *Research in Globalization*. <https://doi.org/10.1016/j.resglo.2023.100120>
- Arnaboldi, F., & Rossignoli, B. (2015). Financial innovation in banking. Palgrave Macmillan studies in banking and financial institutions, *International Journal of Social Sciences and Entrepreneurship*, 2(2), 63-74.
- Beng, J, Yin,L,Liu,X,Hu,M,Li,X, and Liu,L. (2020). Impact of internet finance on the performance of commercial banks in china. *International review of financial analysis*, 72,1-12. <https://doi.org/10.1016/;.irfa.2020.101579>
- Beck, T., Chen, T., Lin, C., & Song, F.M. (2012). Financial innovation: The bright and the dark sides. Working Papers Series, 56.
- Berk, J. M. (2002). Central banking and financial innovation: A survey of the modern literature. BNL Quarterly Review, No. 222.
- Boot, A. W., & Marinč, M. (2010). Financial innovation: Economic growth Versus instability in bank-based versus financial market driven economies. *International Journal of Social Sciences and Entrepreneurship*, 2(2), 63-74.
- Chang, C. C. (2023). The impact of quality institutions on firm performance: a global analysis. *International Review of Economics and Finance*. 83(2023), 694 – 71C
- Chang C.C (2023). The impact of internet – banking on brick and mortar branches. The case of Turkey. *Journal of financial services Research*, 44(1), 187-204. <http://dor.org/10.1007/510693-011-0124-9>
- Chava, S., Oettl, A., Subramanian, A., & Subramanian, K. V. (2013). Banking deregulation and innovation. *Journal of Financial Economics*, 109(3), 759-774.
- Cherotich, K. M., Sang W., Shisia A., & Mutung'u C. (2015). Financial innovations and performance of

- commercial banks in Kenya. *International Journal of Economics, Commerce and Management*, III(5), 1242-1265.
- Dash, M., Tech, M., & Samal, S. (2014). Determinants of customers' adoption of mobile banking: An empirical study by integrating diffusion of innovation with attitude. *Journal of Internet Banking and Commerce*, 19(3), 25-29.
- Dedeh Gri Sudary, Nana Sahroni, A. (2018). Analise del efecto de la banca en la bolsa de valores de Indonesia. *Journal Ekonomi Manajerun*, 4(2) <https://doi.org/10.37058/jem.vi2.699>
- Domeher, D., Frimpong, J. M., & Appiah, T. (2015). Adoption of financial innovation in the Ghanaian banking industry. *African Review of Economics and Finance*, 6(2), 88-114.
- Frank, B.P and Binaebi. B (2019). Electronic payment systems implementation and the performance of commercial banks in Nigeria. *European journal of business and management research*, 4(5) <https://doi.org/10.24018/ejbmr.2019.4.5.112>
- Gianiodis, P. T., Ettlie, J. E., & Urbina, J. J. (2014). Open service innovation in the global banking industry: Inside-out versus outside-in strategies. *The Academy of Management Perspectives*, 28(1), 76-91.
- Itah, A, and Environment, E (2014) impact of cashless banking on bank's profitability. Evidence from Nigeria. *Asian journal of finance and Accounting*, 6(2), 301 <https://doi.org/10.5296/ajfa.v6iz68>
- Johnson, S., & Kwak, J. (2012). Is financial innovation good for the economy? *International Journal of Humanities and Social Science*, 4(7), 23-56.
- Kero, A. (2013). Banks' risk-taking, financial innovation, and macroeconomic risk. *The Quarterly Review of Economics and Finance*, 5(3), 112-124.
- Korir, M.C., Sang, W., Shisia, A., Mutungu, C. (2015). Financial innovations and performance of commercial banks in Kenya. *International Journal of Economics, Commerce and Management United Kingdom*, III(5), 227-247.
- Mabrouk, A., & Mamoghli, C. (2010). Dynamic of financial innovation and performance of banking firms: Context of an emerging banking industry. *International Research Journal of Finance and Economics*, 5(2), 490-489.
- Mahammed, Z., Ibrahim, U.A and Muritala, T.A (2022). Effects of payment system innovations on the financial performance of commercial banks in Nigeria. *journal of service science and management* 15, p35-53 <https://www.scrpiorg/journal/jssnn,doi:10.4236/jssn.2022.151004>
- Malhotra, P., & Singh, B. (2009). The impact of internet banking on bank performance and risk: The Indian experience. *Eurasian Journal of Business and Economics*, 4(6), 43-62.
- Medyawati, H; Yunanto, M. and Hegarinrc, E. (2021). Financial Technology as determinants of bank profitability. *Journal of Economics, finance and Account studies*, 3(2), 91-100. <https://doi.org/10.3299t/jefas.2022.3.2.10>
- Mustapha S.A, (2018) E-payment Technology Effect on bank performance in energy economics- evidence from Nigeria journal of open innovation: technology, Market, and Complexity. Online www.mdpl.com/journal/jqitmcd:10.3390/joitme4040043
- Nader, A. (2011). The effect of banking expansion on profit efficiency of Saudi banks. 2nd International Conference on Business and Economic Research (2nd ICBER 2011) Proceeding 269.

Eneje et al.

- Norden, L., Buston, C.S., & Wagner, W. (2014). Financial innovation and bank behavior: Evidence from credit markets. *Journal of Economic Dynamics and Control*, 43, 130-145.
- Nwankwo, O. and Eze O.R. (2013). Electronic payment in cashless economy of Nigeria problems and prospect. *journal of management research*, 5, 138-151
- Lee, C.C, Wang, C.W; and Ho, S.J (2020). Financial innovation and bank growth: The role of institutional environment. *North American journal of economic and finance* 53(2020) 101195
<https://doi.org/10.1016/j.najef.2020.1011195>
- Ochinanwata, C, Agu, P.I and Radicic (2023). The institutional impact on the digital platform Ecosystem and innovation. *International journal of entrepreneurial behavior and Research*. Online
<https://www.emerald.com/insight/1355-2554.htm#d0110.1108/ijeb-01.2023-0015>
- Okafor, C.A (2020). Cashless policy for business purpose and the performance and the performance of deposit money bank in Nigeria. *International journal of innovative finance and economics research*, 8, 1-13.
- Onay, C. and OZSOZ, E. (2013). The impact of internet-banking on brick and mortar branches.
- Roberts, P., & Amit, R. (2003). The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization Science*, 14(2), 107-122.
- Şimşek, A. (2013). Financial innovation and portfolio risks. *The American Economic Review*, 103(3), 398-401.
- Ugbede, J.T, Tahaya, A and Edicha, M.J.(2019). Effect of electronic payment on financial performance of deposit money banks in Nigeria. *Lafia journal of economics and managerial sciences*, [LAJEMS] 4(I), 114-127
<https://lajems.com/index.php/lajemslartide/new/108>.
- ZU, J., GU, Y., LI, K., and Bonsu, O.A.M (2019). Impact of financial innovations on financial performance: Evidence of Electronic banking in Africa. *International journal of Scientific Engineering and science*, 3(7), 56-67